What is the Grässlin ICUBE™ Module?

Grässlin by Intermatic has developed a new adaptive defrost module for refrigerated walk-in freezers and coolers. It is an easy, versatile, innovative and affordable way to reduce defrost cycles by 40% or more per day! The module can be field or factory installed with our existing DTAV40 or DTSX (OEM Only) defrost timers. This controller provides major energy savings where walk-in freezers and display cases are used, such as in full service, casual and fast food restaurants; hospitals and health care facilities; convenience stores and supermarkets.

Why would our customers want to use the ICUBE™?

It will save customers money by reducing energy usage associated with defrosting walk-in coolers and freezer evaporator coils. Food Service businesses as described above are always looking for cost-effective solutions which can generate energy savings and ultimately save them money with a short return on investment. Some owners are using these types of intelligent evaporator efficiency controllers but with an extremely high cost and overly complicated control. These types of controls can also be very difficult to program and install which takes time away from the contractors, and we all know time means money. With the ICUBE™, you simply install the module right underneath the existing DTAV40 timer and run the sensing wire from the ICUBE™ inputs to the evaporator coils. There is no need to change any other wiring in the system!

What does Adaptive Defrost or Demand Defrost mean?

Both terminologies ultimately mean, a defrost control system which reduces defrost frequency by initiating defrosts or adjusting the number of defrosts per day in response to operating conditions (e.g., measurements that represent evaporator coil frost load, moisture levels in the refrigerated space, etc.) rather than initiating defrosts strictly based on compressor run time or clock time.

Why is the time scheduling still important in relation to defrosting evaporator coils?

Having a timer included within a defrost controller is essential since there are times when a defrost cycle should be delayed, such as a typical product loading period into the controlled cabinet area. When it comes to time initiated defrost controls versus temperature initiated ("Adaptive" or "Demand"), both have their own advantages and disadvantages based on conditional circumstances.

Referencing an "Adaptive"/"Demand" temperature initiate only approach; during a high usage heat load condition, a frost load condition can occur at a more rapid rate due to the exterior ambient air infiltrating the box and making contact with the evaporator coil. A temperature initiate only approach could in-effect initiate additional defrost occurrences versus a typical time initiated control. By introducing a time/temperature hybrid type methodology as the ICUBE™ provides, maintaining the time scheduling aspect the control would in effect temporarily delay a defrost to initiate at an optimal low usage time. During this type of circumstance, a temperature initiate only approach would also in effect create longer compressor run times to pull the box down to the set temperature because it is defrosting during a high capacity period.

Should I have concerns about frost accumulation factors between overridden successive timed defrosts?

Although system capacity loss may occur if a frost load condition accumulates after an overridden defrost event, it would be minimal (10% or less) during a typical 6-hour interval between programmed times. If there is cause for concern and no need to delay a scheduled defrost event during a high usage condition, this type of risk can be averted by simply adding more time initiate schedules to the clock. The ICUBE™ module will override the defrosts anyway if the evaporator coil condition does not require defrosting.

Do you offer a defrost timer with the ICUBE™ already assembled into it?

Yes, the part number available will be DDT40. It easily retrofits into existing mechanical defrost timer applications.

Does the Grässlin DTAV40 Timer or DDT40 Defrost Control wire the same when used with the ICUBE™?

Yes! Other than running sensor wire from the ICUBE™ to the system evaporator coil/s, there is absolutely no change to wiring at the existing terminal locations or at the load or contactor points.

What does the ICUBE™ work with?

For retrofit or new installations, the ICUBE™ simply integrates into an existing or new Grässlin DTAV40 timer. For your convenience we also offer a complete defrost timer control (part #DDT40) which is essentially the ICUBE™ + DTAV40 already assembled together.

What are the part numbers for the different **I**CUBE™ variations?
• **I**CUBE™ for DTAV40 = DDFM
• **I**CUBE™ + DTAV40 assembled together = DDT40
• **I**CUBE™ for DTSX (OEM only) = DDSX
• Additional separate sensor accessory = 178GR10K-1
  (1 sensor, 1 input, tube clip and wire nuts)

Does the **I**CUBE™ come with a sensor included?
Yes, 1 sensor per package.

Does the complete DDT40 come with a sensor included?
Yes, 1 sensor per package.

What is included with the sensor?
1 sensor, 1 input, ⅜" evaporator tube clip and wire nuts.

What is the sensor lead length provided with the ICUBE™?
The probe length is 8'-10' and the input lead length is 5'-6'.

Is there sensor wire range limitations from remote condensing unit to the evaporator?
The **I**CUBE™ is very accommodating and offers an expandability range up to 400 feet (field expandable).

What type of wire can be used to expand the sensor from a remote condensing unit down to the evaporator coils?
Typical field used 18 AWG shielded or unshielded wire.

Can I use any type of sensor with the **I**CUBE™?
No. The 10K NTC thermistor required is the sensor which is included with the Grässlin **I**CUBE™. If additional sensors are required to accommodate multiple evaporator coils or service truck purposes please order the required sensor (178—00002) from your local distributor.

What makes the **I**CUBE™ sensor unique?
For ease of installation, we are providing a unique non-isolated evaporator coil sensor provided by Grässlin only and will be available at your local distributors. This is done to allow the refrigeration contractor to run the sensing wire through existing conduit/raceways in remote rooftop locations to the box cooler/freezer applications. We also want to ensure optimal performance and no possible conflict with sensors from different vendors.

Where is the recommended evaporator probe placement?
Typical bulb sensing placement on an evaporator tube is always at or within proximity to the 2 or 10 o'clock position. You can connect the probe to the coil using the provided ⅜" tube clip. You can also insert the probe between the evaporator cooling fins ensuring the probe is making good contact with the evaporator circuit tube. The evaporator location should be approximately 1" to 2" from either end and at the bottom quarter of the evaporator coil, or where frost typically accumulates the fastest. If there is uncertainty where frost accumulates the fastest, put the system into a manual defrost and monitor for the last area of the evaporator where frost is present prior to a completely frost free coil.

What about systems with more than 1 evaporator?
The **I**CUBE™ has 4 sensor inputs which can accommodate up to 4 evaporator coils. Typically, in a 4 evaporator system, a DTAV40 will activate a contactor which energizes the multiple defrost loads simultaneously. Once the **I**CUBE™ module senses a decrease in capacity in one or all of the coils, the **I**CUBE™ efficiency mode then shuts off and the timer will then initiate a defrost at the next scheduled interval.

Can I use more than one sensor per evaporator coil?
Yes! For larger evaporator installations multiple sensors can accommodate 1 coil in locations as described in the "evaporator probe placement" section.

How do I know when the **I**CUBE™ module is in efficiency mode and bypassing unneeded defrosts?
There is a blue LED indicator located at the top left corner of the **I**CUBE™ module. When the blue LED is on, this indicates the control is in bypass mode saving energy and your customer money!

What happens if the sensor fails?
In the event of a sensor failure, the control would then function as a typical standalone time initiated, temperature, pressure, or time terminated DTAV40. For quick and easy troubleshooting purposes, the LED indicator would then flash a code to indicate that sensor maintenance is required.

It is common for a service technician to "force" a defrost event to check out system operation, which is currently done by rotating the clock to pick up the next timed event. How is this achieved when using the defrost timer with an **I**CUBE™?
This is achieved very easily! Just spin the dial through two consecutive programmed defrost events within 60 seconds. This will manually force a defrost.